

Indian Centre for Plastics in the Environment



ICPE

Vol. 6 • Issue 2 • Apr. – Jun. 2005 For private circulation only

NEWSLETTER

Quarterly Publication of Indian Centre for Plastics in the Environment



Trends in Plastics Packaging Ecological Aspects

Office Bearers • •

President, **Governing Council** Mr. K. G. Ramanathan

Chairman, Executive Committee Mr. M. P. Taparia

. . .

Executive Secretary / Member, Executive Committee Mr. Sujit Banerji

. Treasurer / Member, Executive Committee Mr. Rajiv Tolat

NGO - Projects Member, Governing Council Mr. Vijay Merchant

.

. . .

. **Convenor – Communications** Member, Executive Committee Mr. Suresh Bhojwani

In this Issue

Cover Story	
Trends in Plastics Packaging:	
The Ecological Aspects	3
Model Township with Zero	
Garbage	9
Update	
Fuel from Plastics Waste –	
Commercial Production Started	12
News Item	
Plastic Surgery for Roads	13
Identification Symbols of	
Plastics to Facilitate Proper	
Recycling	14
International News	
Ban on Sachet Water	
Not Solution to Plastic	
Menace – Taskforce	15
World Environment Day 2005	
Green Cities, Plan for	
the Planet!	15
Plastic Bottle Collection has	
Doubled over the Past	
Two Years in the UK	16
Initiative	
School Programme at	
Sardar Vallabhbhai Patel	
Vividhlakshi Vidyalaya &	
Junior College	17
Forthcoming Events	19



Centre for Plastics in the Environment

Mumbai

205, Hari Chambers, 58/64, Shaheed Bhagat Singh Road, Fort, Mumbai - 400 023. Tel.: 022-2269 4105 / 06, 3090 4633 • Fax: 91-22-2264 1468 E-mail: icpe@vsnl.net • Website: www.icpenviro.org • www.envis-icpe.com

New Delhi

1009, Vijaya Building, 10th Floor, 17 Barakhamba Road, New Delhi - 110 001. Tel.: 011-2332 6377 • Fax: 011-2332 6376 • E-mail: icpedelhi@sify.com

Readers are welcome to send their suggestions, contributions, articles, case studies, and new developments for publication in the Newsletter to the ICPE address. Reproduction of material from this Newsletter is welcome, with prior permission.

Plastics for Food Packaging

In 2003, ICPE had published the milestone epochal book "Plastics for the Environment & Sustainable Development". The book had addressed the multifaceted issues and dimensions of plastics, their vital role in our environment and usefulness for both economic and sustainable development and was an example of unparalleled initiative in industrial communication in our country.



The second book in the series -"Plastics for Food Packaging" has now been brought out by Indian Institute of Packaging (IIP) as an outcome of a project sponsored by ICPE.

This book addresses the specific role of plastics in the food packaging applications and how plastics have helped in the preservation, protection, distribution, safety and hygiene aspects of food items, keeping in view consumer convenience and environmental issues. Several experts of Indian Institute of Packaging have contributed to put this monograph together.

The scientific data and information provided in the monograph by the premier institute of the country in the field of packaging will broaden the knowledge horizon of the public at large and will be a reference for food industry, safety regulating authorities and policy makers in the country.

The book will be dedicated to the Nation in a formal launching function at Indian Institute of Packaging, Mumbai shortly.

For more information on Eco-Echoes and about the contents, please contact Mr. T. K. Bandopadhyay, Technical Manager, ICPE, Mumbai.



Cover Story

Trends in Plastics Packaging: The Ecological Aspects

Based on excerpts from the book 'Plastics for Food Packaging', brought out by Indian Institute of Packaging (IIP), as a project sponsored by Indian Centre for Plastics in the Environment (ICPE).

Packaging is one major field of application for plastic materials. Packaging may be defined as "a means of ensuring the safe delivery of a product to the **end consumer** in **sound condition** at the **minimum overall cost**".

Why Plastic Packaging?

Plastics, being synthetic materials, can be **tailor-made** to meet specific or combination of performance requirement of packages.

From packaging point of view, some of the distinct advantages that the plastic materials offer are:

- They are very light in weight.
- They are **non-toxic** and absolutely safe to use even in direct contact with food products, medicines, etc.
- They have excellent barrier properties towards oxygen, moisture and gases to achieve the anticipated shelf-life for products to be packed and



also protect their flavours or aromas from loss through permeation.

- They are **resistant to most** chemicals.
- They **can be sterilized** by all the conventional methods.
- They can be processed to any desired shapes and forms, like
 - Flexible film/pouch
 - Semi rigid tube
 - Rigid sheet/bottle/crate, etc.



- They can be transparent and clear as glass, e.g., PET, Polystyrene and Polycarbonate containers.
- They are sturdy and safe-in-use, because they **do not break easily** and even if they break, the broken pieces are not harmful as those of glass and metal.
- They **do not corrode** in humidity.

- They do not promote any bacterial growth.
- They result in effective cost saving in the storage and transportation, because of lower volume and lesser secondary packaging.
- Various methods for closures and dispensing are available.
- Even the smallest unit packs such as sachets are possible, thereby providing an economical and safe pack to weaker sections of the society.
- They can be made pilferproof, tamper-evident and child resistant.
- They require the lowest energy for conversion.

Thus, **Plastics definitely score over all other packaging materials.** It is needless to mention that if they are used sensibly and judiciously, they should not pose any disposal and ecological problem.



Table 1Consumption of Major Packaging Materials (in metric tonnes)		
	1999-2000	2004-2005 (estimated)
Paper & Paperboard	16,00,000 (34%)	24,87,000 (40%)
Jute/Hessian	15,00,000 (32%)	15,00,000 (24%)
Glass	8,00,000 (17%)	10,20,000 (16%)
Plastics	5,92,062 (12%)	9,24,806 (15%)
Metals	2,48,000 (05%)	2,88,000 (05%)
	47,40,062 (100%)	62,19,806 (100%)
Wood (in million cu.m.)	7.8	7.8

Table 1 above gives the consump-tion of packaging materials.

At present, plastics account for about 12% of the total quantity of major packaging materials, which includes paper and paperboard, jute/hessian, glass, metals (Tinplate, Steel & Aluminium). It is estimated that by the year 2004-2005, plastics will account for about 15% of the total packaging materials and obviously, expected to take some market share or applications of other conventional packaging materials, like glass and metals.

With the Government's liberalization policy and emphasis on exports, the demand for plastics packaging is bound to grow further. There is no doubt the plastic packaging is going to play a very significant role in the years to come. As a result, **India's per capita consumption which is around 4 kgs** at present, **compared to world average of about 20 kgs**, is expected to reach a per capita consumption level of **6 kgs by the year 2005-2006**.

Environment related issues

Important environmental issues, which directly impinge on packaging to varying degrees are:

- Solid Waste Disposal
- Ozone Depletion
- Air Pollution
- Water Pollution (in particular, ground water)
- Sea & Ocean Pollution
- Litter
- Depletion of Non-renewable Resources

According to the OECD (Organization for Economic Co-operation & Development) statistics, packaging accounts for:

- 20.8% of all waste
- 2.0% of gaseous emission
- 1.5% of water consumption
- 3.7% of energy consumption

However, in India, following are considered to be the major problems related to packaging, particularly, plastics packaging.

Indiscriminate Littering

Packaging in general and plastics packaging in particular, has become a matter of concern because of its **high-visibility** all around and **eye-catching** colours, which attract attention of the people.



As a result, by promulgating some rules, number of Municipal Corporations or States in the country have tried **to curb the use of thin plastic carry-bags**, which is identified as the main culprit for all our civic problems. Since in most of the places it has not been effectively implemented, the Central Government has now come out with a Notification – restricting manufacture, stock, distribution or sale of plastic carry-bags of less than 20 micron thickness.

Undoubtedly, in India waste is littered, instead of being disposed properly, to facilitate collection and recycling. Littering is, in fact, an **attitudinal problem of the people** rather than any problem with the plastics material.

A Major Source of Municipal Solid Waste (MSW)



It is true that packaging contributes to Municipal Solid Waste, but definitely, plastic does not



Even in Europe and U.S.A. with per capita consumption of plastics at over 50 kgs per annum, plastic waste makes up only 8% of the total MSW. The rest is made up of organic materials (33%), paper & paperboard (30%), glass and metals (16%) and others (13%).

One must appreciate that plastics make a significant contribution by **reducing the weight and volume of materials** that are typically thrown away.

A study conducted by the "German Society for Research in the Packaging Market" shows that if plastics packaging were replaced with other materials, the weight and volume of disposables would increase approximately by a factor of 4 and 2.5 respectively, along with twice the level of energy consumption and double the cost of packaging.

Plastics are not Bio-degradable

In general, **all man-made products**, during manufacture, processing and disposal, **have an impact on the environment.** It



is, therefore, necessary to understand, which of these products or packaging materials will impose the least burden on the environment.

Other materials, like tinplate, aluminium and glass are also not bio-degradable. The materials of composite containers, like plastic coated paper, cups also do not bio-degrade easily Biodegradability cannot be sole criterion for selecting a packaging material, e.g., wood is a natural and bio-degradable material, but its use for packaging application is discouraged, because cutting timber or deforestation would cause more harm to the environment.

Plastics Packaging: Should it be Replaced ?

The widespread belief that substitution of plastics with paper is more favourable to the environment needs to be supported by facts and a Life Cycle Analysis.

The manufacture of paper bags requires two-and-half times the energy as compared to plastic bags of the same size and for comparable performance.

A stack of, say, **2000 paper grocery bags** will have a height of about **7.5 ft. compared to 7.5 inch height** of equal number of **plastics grocery bags**, which means that transportation and storage costs of empty paper bags are also likely to be more.

It also **produces significantly higher air pollution.** There is a huge disparity in **waste water discharge** in manufacturing or recycling of paper.

As far as **bio-degradability** is concerned, the University of Arizona study shows that the newspapers buried in 1952 were legible. The same observation was made even with the telephone directories. In short, **bio-degradation in buried landfills is a very slow process** (sometime more than 15 years).

Some may argue that paper is manufactured from wood, which comes from trees, and is a renewable resource; while plastic is manufactured from mineral or petroleum oil, which is non-renewable. Against this, the counter-argument would be that the forests play an important role in protecting soil erosion and more importantly, maintaining the right proportion of gases or the gaseous balance in our atmosphere, by absorbing carbon-dioxide and releasing oxygen.

From the available statistics. it is observed that **for making** 1 metric tonne of paper, 17 trees are required as raw material and in our hunger for wood. 44 million hectares of forests have already been felled since our Independence, making this country a land with one of the lowest areas under forest cover, i.e., area under forest to total land area. Therefore, under these circumstances, it may not be a wise decision to substitute all plastics packaging with paperbased packaging.





Even compared with glass, for many applications, plastics packaging may be considered as more economical. A classic example is the light weight **stretched blow moulded PET bottles** for soft drinks or mineral water. A **truck can carry 60% more water with 80% less packaging**, as compared to glass bottles. This also results in fuel savings of almost 40%.

The ratio of product weight packed to the weight of package is the highest for plastics packaging, e.g., for packaging 500 grams coffee powder, the average weight of a

Glass Jar	= 500 grams
Tinplate	
Container	= 130 grams
Plastic	

Laminated Pouch = 12 grams



One kg common salt is packed in a plastic pouch weighing only 5 grams where the ratio of product weight to package weight comes to 200:1.

Therefore, plastics packaging enables to get 'more out of less'.

Making Packaging Eco-friendly

It is not only product itself but packaging too, which is required to be environmentfriendly or eco-friendly. However, environment-friendliness is not in absolute terms, but in relative terms. It means that among the alternative packages, the one, which makes least **harm to the environment**, will be considered as 'eco-friendly package'.

Present endeavour all over the world is to use packaging media generating minimum solid waste, more easily reprocessable, recyclable or biodegradable. The aim is to :

- Use more "Non-waste Technology", i.e., the technology which reduces waste to the barest minimum, e.g., solvent-less lamination, and
- "Manage" the packaging waste and not just dispose it off. The proper and effective waste management system is expected to help in not only improving our environment and eco-system, but also in helping resource and energy conservation. The long-term goal of the global waste management is to keep the landfill amount within 10%.

In this respect, the industrialized countries have already taken a number of initiatives. Germany had introduced an Ordinance on the Avoidance of Packaging Waste in 1991, by which manufacturers and distributors had been obliged to take back used or post-consumer packages and adopted "polluter pays" principle. European Union (EU) had also issued 2 major directives to its member countries in 1994 related to packaging, namely, **General Packaging Directive** and Plastics Directive. In all these, major thrust is on 3 R's, i.e. Reduce, Reuse and Recycle.

It is worth noting that no country in the world has yet completely banned plastics for packaging applications. Of course, some countries have restricted the use of particular type or some kinds of plastics packaging; but that is done purely on the basis of non-availability of local recycling facilities.

In the advanced countries, though bio-degradable plastics are available for decades, considering economy and long-term degradation process, its use has neither been made mandatory nor become very attractive. Other kinds of degradable plastics packaging materials including **Water Soluble Films**, which are available in India too, are also being **used in a very limited manner**.

For minimizing packaging solid waste, the present trend is to follow the priorities given below.

Avoidance or No Packaging

It means elimination of package or packaging materials, wherever possible. For example, a secondary pack made of EPS, i.e., expanded polystyrene used for packing a glass bottle (primary pack) is either eliminated by using a plastic bottle as primary pack or substituted by paperbased honey-comb board, where there is a restriction to use plastic forms.

Consumable Packaging

The idea is to eliminate completely the possibility of generating packaging waste, if not the package itself, e.g., instead of using the conventional metal drum, if suitable plastic/laminated bags are used for packaging of tar or asphalt, these can be consumed 100% at the time of using the product. In fact, it may improve bonding character of the product.

Reduction or Optimum Packaging

It means reducing or optimizing packaging materials at source.

This is achieved **in terms of weight or volume** of packaging materials through an alternative



material or improved design, but without sacrificing product quality. For example, the weight of a 200 litre drum can be drastically reduced by changing its packaging material from steel (weighing 20-22 kg) to HDPE (weighing 8.5-9.2 kg).

It is worth noting that, of late, product packers have moved to plastics in order to achieve a decrease in packaging weight. This trend is likely to continue. One should appreciate that **'weight is cost'**.

Even without changing packaging material, improvements in resins/technology have enabled down-gauging to achieve source reduction in number of cases (Refer Table 2).

Change over from **rigid to flexible packaging** also ensures reduction at source. In general, flexible packaging generates 60-90% less waste than rigid containers.

Some of the **common appro**aches followed to reduce package weight are:

- Changing design and construction/designing lightweight shapes
- Using materials with higher performance
- Marketing refill/recharge units
- Introducing product concentrates or re-designing/reengineering
- Choosing a package type considering weight/volume ratio and total volume
- Limiting production tolerances
- Choosing processes that allow less material
- Light-weight packages without changing appearance

Reusable, Returnable or Refillable Packaging

Some types of packages are being returned for reuse or to refill the products number of times, e.g., plastic crates, containers (like large milk cans), pallets, etc., this is done primarily to avoid generation of solid waste.

Table 2			
Plastic Packaging	Original Weight/Thickness	Current Weight/Thickness	% Source Reduction
• PET Bottles 1.5 litre 2 litre	66 gram 68 gram	42 gram 51 gram	36% 25%
• HM-HDPE Bag	47 µ	25 µ	47%
• Yogurt Cup	12 gram	25 gram	58%



To ensure return of the packages, if necessary, a 'deposit scheme' or any other suitable scheme may be introduced. Of course, at times, cost of collection, transportation back to the filling station, cleaning of used packages, etc., may not be economical.

Recycle Packaging

The **recyclability of a package** or the **use of recycled content** in the package is considered to be the most desirable alternative all over the world now from an environmental stand point.

In the first case, the package is designed or selected on the basis of easy and economic recyclability character of the material, e.g., mono-film or single packaging material (without lamination or coating) is preferred, compared to multi-layer or laminated/coated material, provided functional properties do not vary much. For the same reason, trend is to replace multiplayer film like 10µ PET/10µ **Met-PET/100-200 g LD by a 35**µ heat sealable BOPP for biscuit wrapping, wherever possible. Similarly, if the **bottle is made of** PP, its closure is also made of **PP**, so that **segregation is not** needed for different compo**nents** of the same package and the whole package can be sent to one recycling plant.

In the case of using recycled packaging material/packages, the trend is to use the recycled material in the middle of the

Table 3			
Package		Oil Consumption	Resource
Number	Туре		Saving
1000	1 litre Glass Bottles	230 kgs	57%
1000	1 litre Plastic Bottles	100 kgs	
1000	Paper Bags	47 kgs	32%
1000	Plastic Bags	32 kgs	

multi-layer container (3-layer). The HDPE recycled bottles have been successfully used for packaging of motor oil, detergents, softeners, pesticides, etc., Examples of such containers are:

• Motor Oil (5 litre) Container

Inner layer - Virgin HD (10%)

Centre layer – Recycled HD (70% including 25% postconsumer waste recycle)

Outer layer - Virgin HD (20%)

• Detergent/Softener Bottle Containing 25 to 30% recycled HD (target – 50%)

In fact, for making its package (of window-cleaner) more ecofriendly, a company has changed original **one-shot container**, first by a **refill pack (stand-up pouch)** primarily to reduce weight, and then by a co-extruded **reusable bottle** with structure like **HD**/ **LLD/PE (reverse printed).**

Recoverable Packaging

If packages cannot be reused or recycled economically, one thinks of recovering it in some way or the other, otherwise it is considered as waste of raw material and energy.

Plastic wastes contribute to increasing calorific value of municipal solid waste for incineration, which is a useful source of energy, estimated to be from 8-9 GJ/T to 20 GJ/T. Moreover, compared to other common combustible materials, an average plastics produce more heat energy, e.g.,

Plastics	- 40 MJ/kg
Coal	- 30 MJ/kg
Wood	- 15 MJ/kg
Paper	- 15 MJ/kg
Textiles	- 13 MJ/kg

In Western Europe, plastic wastes provide 30% of energy generated in MSW recovery plants.

Other Ecological Considerations

If we consider reclaimable energy content of plastics, along with the energy required to process raw materials into finished goods or packages, it could be seen that the **energy (oil) consumption to make plastic bottles or plastic bags is much less** compared to that of glass bottles or paper bags for comparable use and performance levels. In other words, plastics help in resource saving, as highlighted here in Table 3.

From conservation of raw material resources point of view, it could also be seen that plastic packaging is better than other type of packaging, i.e., with the same quantity of packaging raw material, more number of packages can be produced from plastics, e.g. **number of bottles** (1 litre capacity) produced per kg raw material:

1 kg Raw Material	No. of Bottles
Glass	3
Tinplate	10
HDPE	11
PVC	25
PET	31

It has been observed that to pack 1 tonne of foodstuffs in 1 kg package, we need only 32 kgs of PET, as compared to 350 kgs of glass, 100 kgs of tinplate, 90 kgs of HDPE and 40 kgs of PVC.

Conclusion

Packaging represents one of the most significant material support to lifestyle, produced by the industrial society. It best expresses the way our society's material life is organized. Plastics being synthetic materials can be tailormade to meet specific or performance requirements of packages.

Plastic has effectively replaced its other counterparts due to its lightweight, strength, moistureresistance and durability. Plastic packaging also has storage, production and distribution advantages over other packaging mediums.

Due to increasing awareness, plastics have gained social importance as an environmental friendly material in terms of lesser energy consumption, low weight and volume of disposables, lesser pollution and conservation of natural resources.



Model Township with Zero Garbage

Plastics in the Environment Group (PEG) of Indian Petrochemicals Corporation Ltd., Baroda, being inspired by the ICPE initiated Surakhsha Garden Dry Waste Management Model of A-ward of Mumbai, had already initiated a Plastics Waste Segregation Project in ICPE's Baroda Township in 2003.

IPCL's Nagothane Township authorities have now adopted the idea and have implemented a 'Zero Garbage Concept' in the Complex and Township with the guidance of NGO-Stree Mukti Sanghatana, also are one of the partners to ICPE's Waste Management Activity in Mumbai Wards.



ICPE provided necessary support in disposing of the segregated dry waste to recyclers.

Stree Mukti Sanghatana has also helped the Township in setting up composting pits to convert all wet (bio-degradable) waste into manure. Thus a waste disposal system has been established and put in place.

It is heartening to note that the Nagothane Township of IPCL, housing more than 1000 families, has been able to implement a 'Zero Garbage Concept' within a very short period of time.

It has become a model township for others to emulate.





















ICPE Participation in PrintPack Asia 2005 Bangalore, 23-26 June, 2005

ICPE was at PrintPack Asia 2005 held at Bangalore during 23-26 June 2005. The exhibitors included a cross section of packaging, printing and ancillary industries besides press (publishing) media. The visitor profile was also a cross section of industries, institutions and others. The visitors were primarily from the southern states.

The ICPE booklets ... "Myths and Realities" in English and Kannada were distributed among visitors, other exhibitors as well as at the exhibition reception counter.

Typical queries received include:

- Process of recycling / technologies
- Sources of supply of plant and machinery for recycling and end use applications of recyclates
- Flexible laminate waste and its recycling process
- List of recyclers and plastics waste dealers.

PFFCA STAR Awards 2005

Awards for Excellence in Design, Development and Creativity



Entry Categories

- Product Development (Basic Substrates)
- Product Development & New Structures
- Carton/Pouch Newer Forms/Innovations & Creativity New Applications
- Enviro Products
- Non Packaging Applications
- Special Entry Category Students/Institutions

For details, contact:

Paper, Film & Foil Converters' AssociationPFFC.E-mail: pffsaica@bom7.vsnl.net.inE-mail

PFFCA Awards Co-ordination Centre

E-mail: siessopptc@vsnl.net siescom@vsnl.net

11

Update

Fuel from Plastics Waste – Commercial Production Started

A team comprising Mr. T. K. Bandopadhyay, ICPE



and Dr. Shashikant Sharma, R&D, IPCL, had visited the Inventor's laboratory in November 2004 and observed a demonstration of the process of manufacturing Fuel from Plastics Waste, in laboratory scale. The report was published in Eco-Echoes Issue 3 & 4.

The team again visited the unit in June 2005 to observe the unit's commercial operation in running condition and to interact with the inventors.

Salient points of discussions and observations:

- The unit has started its commercial production since April 2005 and within two months of operation, has attained more than 100% of its designed capacity – 5000 litres of Fuel per day from 5 MTD of Plastics Waste.
- Present selling price is Rs. 18 per litre.
- Unit's 5000 litres production capacity is fully booked by local users.
- Local traders supply the input, low-end plastics waste, @ Rs. 3.0 to Rs. 3.5 per kg. Also some MNC's and large scale plastics/multi layer plastics laminate manufacturers have started supplying their factory waste to this unit, free of cost, presumably to get rid of the disposal problem of their waste in an environment-



The Reactor which converts Plastics Waste into Fuel

friendly manner, without attracting criticism from the regulatory authorities.

More than 500 MTs plastics waste consisting of multi layer film & laminates, low-end postconsumer plastics waste consisting of carry bags and other plastics, nylon pipes, woven sacks, computer and automobile parts, etc., (Pepsi Co, Paper Products, Bhadrachalam Paper Mills are some of such industries).

- Maharashtra Government has signed a MoU with the unit for production of Fuel from Waste Plastics at a place near Mumbai. However, details of the modalities are yet to be framed.
- The inventors are also negotiating with other private/public organizations to set up similar facilities elsewhere.





Low-end Plastics Waste awaiting conversion into value-added Fuel

Plastic Surgery for Roads

For the past one month Mr. Datta Dalvi, Mayor of Mumbai, has been on a raiding spree. The target of his ire: the ubiquitous plastic bag, of which he's confiscated 2.5 tonnes.

The evils of the plastic bag - the one less than 20

microns in thickness and thrown away after one use – need no reiteration. Ragpickers don't find it profitable to collect them, and the non-biodegradable monsters mostly lie around, playing havoc with the city's drainage and environment. In Mumbai the plastic waste menace is a serious one – on an average, the city produces 40 tonnes of plastic waste daily of which only five tonnes are recycled through ragpickers.

But now there's solution in sight, and the city's roads will provide it. Only, the plastic won't be flung on the roads but into them.

Reusing plastic waste to pave roads is an experiment that's been successfully

conducted in many other places such as Kalamasseri in Kerala, Kolkata and Bangalore. Not only does the road become a receptacle for plastic waste but also gives a better grip. The plastic also brings down the quantity of bitumen used by 10%.

Mumbai caught on to the idea two years ago, when the BMC's road department experimented on a few roads at Prabhadevi. Right now it is in the process of fine-tuning and has appointed an NGO, the Indian Centre for Plastics in the Environment (ICPE), to provide shredded plastics. "We are



View of the road – 6 months after completion

working on the project along with ICPE, but there's been a delay because they've been unable to set up a shredder so far," says Mr. J. T. Barbhaya, Deputy Municipal Commissioner in charge of roads. Mr. T. K. Bandopadhyay, Technical Manager, ICPE, however, assures that the project will

News Item



Another view of the road

be underway in the next one month. "The cost will be negligible as the plastic will be provided by the civic solid waste department," he says.

The plastic road show has been on in some other cities for a while – the Rajagiri College of Social Sciences at Kalamasseri took the lead to show that plastic waste can be used very effectively in the laying of roads in Kolkata. The Metropolitan Planning Committee has advised the civic authorities to lay polymer-blend bituminous roads, and the Bangalore Municipal Corporation, with the help of Bangalore University's Centre for Transporta-

tion Engineering, has already laid 35 km of roads with the newly developed compound.

How does it work? The plastic waste is collected, shredded and added to the aggregate (metal) which is then heated to 170 degrees. At 140 degrees, the plastic melts (which takes about 30 seconds) and sticks to the metal. The burning does not emit pollutants, and the plastic waste not only binds the metal but also increases durability and longevity of the road. A win-win situation for all.

(As reported in Times of India, Mumbai, 13th June, 2005)

IS 14535 : 1998

Identification Symbols of Plastics to Facilitate Proper Recycling

There are many different types of plastics, and each type requires different handling in the recycling process.

The next time you pick up a milk jug or 2-litre plastic soft drink bottle, look at the bottom. Do you see a triangle made out of three arrows? This symbol means that the plastic can be recycled. Inside the triangle you will see a number or perhaps an acronym made up of several capital letters. The numbers and acronyms are part of a coding system that identifies what type of plastic the item is made out of, and how it should be handled in the recycling process. The numbers shown inside the chasing arrows refer to different types



1 - PET (Polyethylene Terephthalate)

- PET is used in the production of packaged drinking water and soft drink bottles, etc.
- PET can be recycled into fibre-fill for sleeping bags, carpet fibers, ropes, pillows, etc.



2 - HDPE (High-density Polyethylene)

- HDPE is used for manufacturing raffia bags, knitted fabrics, water, gas & sewer pipes, small volume bottles to large barrels, house-wares, storage bins, caps & closures, shopping bags, etc.
- HDPE can be recycled into flower pots, trash cans, traffic cones, detergent bottles, soap cases, other household items, etc.



3 - PVC (Polyvinyl Chloride)

- PVC is used for manufacturing blister packaging, pharmaceutical tablet packaging, potable water pipes and irrigation pipes and fittings, door & window profiles, office partitions, cables, supported & unsupported calendered sheets, floorings, medical products like blood bags & tubings, footwear, etc.
- PVC can be recycled into footwear, irrigation and other drainage pipes, mats, etc.

of plastics used in making plastic products and containers.

Identification

The manufacturers of plastics end products from either virgin or recycled plastics are required to mark the symbol at the time of processing in order to help the waste collectors/reprocessors to identify the basic raw material. The symbols defined by Society of the Plastics Industry (SPI), USA are given below.

This is required because all types of plastics are not compatible with each other and hence if those are mixed together proper recycling may not take place.



4 - LDPE (Low-density Polyethylene)

- LDPE is used for manufacturing wide width film, agricultural films and pipes, heavy duty bags, shrink film and cable insulation & sheathing, extrusion coating, liquid packaging, etc.
- LDPE can be recycled into grocery bags, shelter film, household items, etc.

5 - PP (Polypropylene)

- PP is used for manufacturing raffia, monofilaments, multi-filaments, strappings, automobile batteries various automobile components, luggage and furniture, thin-wall containers, combs, ball pens, medical applications like injection syringes, various white goods, etc.
- PP can be recycled into plastic lumber, household goods, luggage, etc.

6 - PS (Polystyrene)

- PS
- PS is used for manufacturing disposable cups, packaging materials, meat trays, audio visual cassettes, etc.
- PS can be recycled into plastic lumber, cassettes tape boxes, flower pots, etc.

7 - Other



- This category includes other plastics like nylon, ABS, PBT, PolyAcetals, Poly-Carbonate, etc.
- Recycling of these high value plastics are special in nature.



International News

Ban on Sachet Water Not Solution to Plastic Menace - Taskforce

The National Plastic Waste Management Taskforce (NPWMT) in Ghana, recently said the ban on the sale of sachet water would not be a solution to the plastic menace in the metropolis. Mr. Devine Otoo, Chairman of NPWMT, therefore appealed to government to enact a law to compel polluters to pay levies on their products. Speaking in an interview, Mr. Otoo said polluters had expressed their readiness to pay the levy to find a lasting solution to plastic waste.

He said the Ministry of Environment and Science was steadily working on the law and appealed to government to expedite action and provide the NPWMT with more logistics for their operations.

Mr. Otoo said the use of plastics had become indispensable in the country and stressed the need for institutions to educate the public on its management.



He said the National Association of Sachet Water Producers and Ghana National Plastic Manufacturers Association and Accra Metropolitan Assembly were assisting the Taskforce with 40-50 vehicles in the "Operation Chase the Plastics" programme.

The operation, he said, would overhaul the system of plastic waste as well as generate interest and raise awareness of the public on plastics collection.

He said, under the programme the Taskforce would employ close to over 2,000 persons to assist in the collection of plastics in the metropolis starting from May 21, 2005. "Under the programme, we hope to get evidence of our work in the city within a six-month period," he said adding, "all we need is to get the relevant facilities to work with."

He expressed the hope that the programme would be extended to the regional capitals.

Mr. Otoo called for more education on waste disposal stressing, "If people stop littering and plastic waste is disposed off in bins, its management will become easier and the cost of managing the waste will reduce."

Mr. Derrick Ayeh, Managing Director of Plastic Waste Management Ghana Limited, said his firm was engaged in collecting plastic waste in the metropolis and had so far exported 160,000 tonnes of plastics to Asia and North America.

Mr. Ayeh identified the segregation of waste as a major problem confronting their operation.

(Source: Ghana News Agency)

World Environment Day 2005 Green Cities, Plan for the Planet!

World Environment Day is commemorated each year on 5th June and is one of the principal vehicles through which the United Nations stimulates worldwide awareness of the environment and enhances political attention and action.

This year's theme for World Environment Day was **Green Cities** and the slogan was **Plan for the Planet!**

The aims of the celebration of World Environment Day (WED) are to promote an understanding that communities are pivotal to changing attitudes towards environmental issues and advocate partnership which will ensure all nations and people enjoy a safer and more prosperous future among others. Please check http://www.unep.org for further information and events organised worldwide as part of the 2005 WED.

The theme of **Green Cities** was destined to highlight efforts made for and by cities – where demographic growth, poverty and illhealth are intertwined and the most challenging – in the environmentally sound management of their infrastructure and to encourage similar efforts and partnerships where they are most needed. **The Basel Convention Secretariat** took advantage of the occasion of WED to highlight its activities that are linked to the theme of Green Cities. These are two projects, known as the 'Municipalities' projects, which are being carried out in the cities of Qingdao, China and Guayaquil, Ecuador. The projects come under the New Partnership with Local Authorities for the Environmentally Sound Management of Hazardous and Other Wastes (in the context of the implementation of the Strategic Plan of the Basel Convention, adopted in 2002) and are both undertaken in partnership with the UN Institute for Training and Research's Decentralized **Cooperation Programme.**

(Source: www.basel.int)

Plastic Bottle Collection has Doubled over the Past Two Years in the UK

10.5 per cent collection rate/2005 expected to be "a year of maturity".

The collection of plastic bottles has increased by 100% over the past two years, according to research funded by the Waste and Resources Action Programme (WRAP) and conducted by the plastics recovery organization *Recoup.* The survey showed that plastic bottle collections in the UK had risen to an estimated annual level of almost 48,500 tonnes at the end of 2005. Given that an estimated 460,000 tonnes of plastic bottles entered the

of plastic bottles entered the UK household waste stream each year, the collection rate stood at 10.5%. The authors noted that, "while this is a significant increase on 2003, this rate remains relatively low compared to other major European countries and North America – indicating that there is clear potential for combined growth". The actual recycling rate was

calculated as 7.9%.

While the recycling of plastic bottles was not a key driver for local authorities, recycling strategies were, because bottles were low weight items and current UK recycling targets were weight based. One reason behind this improvement was greater pressure for effective recycling programmes to be provided. An increase in government funding for plastics recycling had also made its mark and there was increased public recognition that plastic bottle recycling facilities could be provided cost effectively. Besides improved baling and handling infrastructure, other causes included strong public demand for these services, rising land fill tax on residual waste and increased confidence in markets for collected plastics bottles.

The authors forecast that the collection of plastic bottles would rise to around 52,000 tonnes per year by the end of 2006 through planned initiatives. The majority would continue to be collected through kerbside collection schemes. If a good performance was seen, by both kerbside and bring schemes, the collection of almost 130,000 tonnes of plastic bottles might be feasible, the survey found. Factors including the future collection of plastic bottles for recycling included placing greater emphasis on kerbside



collection activities, which outperformed bring schemes by a ratio of 4:1. In addition, the authors suggested that UK baling and handling infrastructure should be reviewed and the potential to expand should be assessed where necessary.

As regards to kerbside collection schemes, the survey determined that these initiatives accounted for 68% of the plastic bottles collected at the end of 2004. Bring schemes were less important in terms of volumes collected with a 32% share. Local authorities had reportedly also indicated that kerbside collections would continue to grow between 2005 and 2007. At present, around 8.4m households in the UK participated in kerbside collection schemes for plastic bottles, meaning that 34% of households had access to these services. This also represented a 55% improvement compared to the state of affairs at the end of 2003.

Between now and end of 2006, the provision of plastic bottle collection within kerbside schemes was set to exceed 10.9m households or 44% of the population.

The number of bring sites had risen to almost 4000. Local authority plans suggested a continued climb 'in bring facilities' over the next year as new sites and schemes are developed with approximately 5000 sites

expected to be operational by the end of 2006. The report showed that 73% of all local authorities offered some collection facilities for plastic bottles. The reported cost of bring schemes for plastic bottles was estimated to stand at between £50 and £350 per tonne of bottles collected. The authors pointed out that it was difficult to separate out the cost of plastic bottle recycling through kerbside collection schemes, as they were typically collected together other waste fractions.

Amongst the major reasons cited for not including plastic bottles in collection schemes, the survey found that cost was a big factor. However, "53 of the local authorities that responded to the survey indicated that it costs them little or no extra to collect their plastic bottles for recycling compared to collecting them for land fill/ other disposal routes demonstrating that plastic bottles recycling could be achieved cost effectively in well designed schemes" - the authors noted. Other reasons included a focus on the heavier materials, the use of kerbside sorting vehicles with limited compartments and a lack of local baling and handling facilities.

(Source: EUWID, Packaging Markets, No. 14, June 28, 2005)

Initiative

School Programme at Sardar Vallabhbhai Patel Vividhlakshi Vidyalaya & Junior College

Kandivali, Mumbai

An awareness programme on 'The Environment and Plastics' was organized at Sardar Vallabhbhai Patel Vividhlakshi Vidyalaya & Jr. College, Kandivali, Mumbai, on 18th June, 2005.

Two programmes were organized on the same day – one for English Medium and the other for Gujarati Medium School students, both of Standard IX.



Ms. Sangeeta Srivastav, Principal of the School, addressing the students.

The programme consisted of:

- Power Point Presentation
- Screening of Audio Visual CD's
- Discussion / Interaction with the Students

The Power Point Presentation was prepared with the following points:

- 1. What is Environment?
- 2. What are the major reasons and sources of Environmental Pollution?
- 3. Role of Plastics for maintaining a cleaner Environment.
- 4. Waste Management and our responsibility towards adopting Two-Bin Culture and Segregation of Waste at source.
- 5. Recycling of plastics.

Three CD's were screened:

- 1. ICPE's Cartoon film on 'The World of Plastics'.
- 2. ICPE's AVI on Segregation of Waste at Source and Recycling of Plastics.

3. Stree Mukti Sanghatana's CD on Waste Management at Mumbai.

Screening of CD's was followed by interaction with students.

From ICPE, Mr. T. K. Bandopadhyay made the Power Point Presentation and he along with Mr. Rajiv Tolat took part during the Interaction session with the students.

The students and the teachers understood the fact that plastics are good for environment and people should act responsibly for managing the waste.



Mr. T. K. Bandopadhyay of ICPE interacting with the students.

The Principal of the school was satisfied with the programme and requested ICPE for making further presentation to students of all levels and also to the parents of the students.

ICPE assured the school authorities that it would respond to their invitation positively.



Students listening attentively to the presentation.

Some of the Slides Presented at School Programme





Forthcoming Events

Plasticon Awards 2005 Recognizing Excellence



The Foundation has instituted Plasticon Awards to promote and encourage Innovation and Excellence in all segments of the Plastic Industry.

The Awards germinate from a perceived need to

honour and recognize excellence of Organizations, Individuals, Companies and Institutions actively involved in research and development of plastics, and related products and honour their pathbreaking contribution to the overall development of Indian Plastics Industry.

Award Categories: (1) Creative Packaging Award, (2) Contribution to Agriculture Award, (3) Innovation in Recycling Technology Award, (4) Innovation in Conservations of Energy, Material and Ecology Award, (5) Innovative Infrastructure **Product Award (Plastics products** in Building, Telecom, Healthcare & Transportation), (6) Innovative Product Award (Engineering, Appliances, Consumer Care, Sports & Leisure industries), (7) Innovative Materials Award (Polymers, Compound, Blends, Alloys Master-batches and Additives), (8) Best Research Award (Polymer Sciences, Technology & Engineering), (9) Innovative Plastics Processing & Ancillary Equipment Award, (10) Innovative Dies & Moulds Awards, (11) Outstanding Contribution Award, (12) Outstanding Public Awareness Award, (13) Outstanding Export Award, (14) Best

Performing Enterprise Award – SSI Category, (15) Best Performing Enterprise Award Non-SSI Category, (16) Best Student Award.

Eligibility: Companies, Individuals, R&D Organizations, NGO's, Academic Institutions and Professionals in India are eligible to participate. All applicants/NGO's/ Organizations must be Indian citizens registered and operating in India.

Awards: There would be two Awards in each category:

- 1) Winner Trophy (along with citation)
- 2) Runner-up Trophy (along with citation)
- 3) Best Student Award carries cash

Entry form: Detailed information is available in the brochure. You can also download the entry form from website: www.plastindia.org/awards.asp

Last date for receiving entries: August 20, 2005

Organized by: Awards Committee Plastindia Foundation 401, Landmark 'B', Suren Road, Andheri (E), Mumbai - 400 093. Tel: +91-22-26832911-14 Fax : +91-22-26845861 E-mail: awards@plastindia.org www.plastindia.org/awards.asp

The Recycling and Waste Management Exhibition Birmingham, UK 13th-15th September, 2005

www.rwmexhibition.com

INTERPLAS 2005 Birmingham NEC, UK 4th-6th October, 2005 Asia's biggest and one of the largest fairs in the world of Plastics:



PLASTINDIA 2006

6th International Plastics Exhibition & Conference 9th-14th February, 2006 Pragati Maidan, New Delhi

INDIA:

ENDLESS OPPORTUNITIES

As a nation that has experienced stupendous growth over the past two decades, India is today the world's 2nd largest growing economy. There is no other country more conducive to the expansion and development of the plastics industry.

With a double-digit growth of around 15%, Indian per capita consumption of plastic is set to rise from 4 kgs to 10.5 kgs by 2010 and its polymer consumption to 12.5 MMT per annum, making India the 3rd largest polymer consumer in the world.

PLASTINDIA 2006 attempts to provide a platform for both, members of the Indian plastics fraternity and their international counterparts, to discuss and display their latest innovations in plastics.

PLASTINDIA 2006 is the most awaited event for product sourcing, technology exchange and joint venture.

For further details contact: PLASTINDIA FOUNDATION Tel.: (022) 2683 2911 E-mail: plastindia@vsnl.com www.plastindia.org





Indian Centre for Plastics in the Environment www.icpenviro.org • www.envis-icpe.com